REMARKS

Applicant intends this response to be a complete response to the Examiner's **5 January 2010** Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

DETAILED ACTION

Election/Restrictions

The Examiner states and contends as follows:

1. Restriction is required under 35 U.S.C.121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group 1, claims 49 - 66 and 96 - 97, drawn to an extruded oriented film comprising a layer of alloy of at least two polymers.

Group 2, claims 1 - 49, drawn to a method of manufacturing said extruded oriented film.

Group 3, claims 67 - 95, drawn to an apparatus for extruding a thermoplastic material.

2. The inventions listed as Groups 1, 2 and 3 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: unity of invention is present a *priori* since there are common technical features to the three Groups of inventions, such as the phase separation characteristic of the extruded oriented film. However, the coextrusion of oriented films comprising two polymers with a phase separation characteristic is taught by Momose US Patent No 5,019,439 (Abstract). Thus, the corresponding technical features is not the inventors own contribution to the art. Therefore, there is no special corresponding technical feature or unity of invention between the claimed Groups.Restriction is appropriate.

3. **Applicant is advised that the reply to this requirement to be completed must include(i) an election to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention.**

4. The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be consider timely. Failure to timely traverse the requirement will result in the lost of right to petition under 37 CFR 1.144.If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

5. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

6. Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence of admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

7. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

8. During a telephone conversation with Robert Strozier on November 05, 2009 a provisional election was made with traverse to prosecute the invention of Group I, claims 49-66 and 96-97.Affirmation of this election must be made by applicant in replying to this Office action. Claim 1-48

and 67 to 95 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

9. In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104.Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112.Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. Failure to do so may result in a loss of the right to rejoinder. Further, note that the prohibition against double patenting rejections of 35 U.S.C.121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues.See MPEP § 804.01.

Applicant traverses the restriction requirement. The apparatuses, methods and films are directly related and inextricably interwoven. The apparatuses are specifically designed to produce the films of this invention. Likewise, the methods are specifically designed to produce the films of this invention. The unique structures of the apparatuses and the unique features of the methods are necessary for producing the unique features of the film. Additionally, the unique features of the films require the unique features of the apparatuses and the methods. Unity of invention under the PCT are satisfied by the unique attributes of each of the three groups, films, apparatuses, and methods and the fact, that the apparatus is specifically designed to produce the film and the methods are specifically designed to produce the film.

Applicant, therefore, respectfully requests withdrawal of this restriction requirement. If the Examiner upholds or maintains the restriction requirement, Applicant affirms the election of Group 1.

Claim Rejections - 35 USC § 112

10. **Claims 49 - 55** stand rejected under 35 U.S.C.112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner states and contends as follows:

> It is unclear the meaning of the limitation for the P1 fibrils to exhibit "locations of rupture" in independent claim 49. For examination purposes it is interpreted to mean "points of discontinuation".

Applicant respectfully requests the retention of the term "locations of rupture". This term is fully described in the specification. The terms relates to the locations, where the fibrils have been ruptured (broken) by stretching. The specification never uses the term "discontinuation", let alone

the term "locations of discontinuation". While Applicant appreciates the fact that the Examiner desires that the claims use terms that are clear and definite, Applicant asserts that the specification more than adequately defines and describes this term:

> **[0023]** A first aspect of the present invention is based on the concept that the fibrillar grain structure mentioned above is given a strong orientation at a temperature at which the fibrils are solid while the surrounding polymer material (which in solid state also normally is at least partly crystalline) is molten. In particular the method involves orientation over a frictional surface while the part-molten film is hauled off from the extrusion device, although it also is possible first to solidify, later partly re-melt the film and then perform the stretching. After this hot stretching and after solidification of the entire film composition with mainly the fibrils oriented, the film is preferably further stretched at a lower, preferably much lower, temperature. **Such subsequent cold stretching will normally rupture the fibrils or fibril network at microscopic intervals along the length of the fibrils,** while the film material on the whole remains intact, the film having a degree of elongation before it breaks than a film not having been subjected to this cold stretching. This state has been found to provided improved yield tension and creep properties without adverse effects on tensile energy absorption and behaviour of the film under shock, e.g. shock-tearing or shock-puncturing, a discovery which is further described below.
> **[0058]** As regards the orientation after full solidification of both components, the cold stretching, at least a first step is preferably carried out in the same longitudinal direction as the previous hot stretching of the film. By a suitable selection of the conditions for the different stretching processes, and optionally by addition of finely dispersed fracture-promoting material to the extruded blend, **the longitudinal cold stretching is preferably adapted to produce locations of rupture of the P1 fibrils and, in connection with such rupture, extra orientation of P2 in and around the said locations. Hereby the locations will have a generally linear extension at an angle to the direction of orientation. This is illustrated in FIG. 8.**
> **[0088]** Characterising features are the following alternatives, which also can be combined:
> **[0089]** a) the P1 fibrils are flat and generally parallel with the main surfaces of the film with thicknesses generally around or lower than 1 µm and a width at least 5 times the thickness,
> **[0090]** b) **the oriented film exhibits locations of rupture of the P1 fibrils, which locations have a generally linear extension angularly to the direction of orientation.**
> **[0197]** The inventor believes that this form of the strain/stress graph is a result of the microstructure shown in FIG. 8, in which there is **highly overstretched LLDPE in the regions where the PP fibrils are broken**, while the LLDPE is stretched much less than the PP outside these regions. The change from elastic to permanent deformation means that the rupturing of the PP fibrils begins to propagate. The very sharp change from elastic to permanent deformation will show as a high creep resistance.

Specification at paragraphs 23, 58, 88-90 and 197. Applicant has added language to indicate that the fibrils are broken at the locations of rupture.

Applicant, therefore, respectfully requests withdrawal of this section 112, 2nd paragraph rejection as the specification more than adequately defines and describes the meaning of this term.

Claim Rejections - 35 USC § 102

11. **Claims 56-60** stand rejected under 35 U.S.C. 102 (b) as being unpatentable over Momose US Patent No 5,019,439.

The Examiner states and contends as follows:

> 12. Considering claims 56 - 60, Momose teaches an extruded oriented film comprising a layer of alloy of two polymers, the second resin corresponding to applicants P1 and the first resin

corresponding to applicants P2. The first resin may be, for example, a polyolefin such as polyethylene or polypropylene, polystyrene, a polyacrylonitrile, polyester, a polycarbonate, poly vinyl chloride, or a modified resin thereof. The second resin may be, for example, a polyamide, a saponified ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer EVOH (Col.3, lines 42 -48); both resins are partially crystalline under 100°C (*i.e.* nylon 6 P1 and polyethylene P2, as described' in example 2); wherein P2 in its unoriented state at 20°C exhibits a coefficient or modulus of elasticity more than 15 % lower than P1, and the alloy comprises a dispersion of microscopically fine fibrils (tapes) of P1 surrounded by P2. These fibrils or tapes extend each mainly in one direction and has width and thickness lower than 5 μm; said fibrils are flat and substantially parallel with the plane of the film, with thickness preferably in the range 0.05 to 10 μm and width more than five times the thickness (Col.3, lines 1-21). Furthermore, that as result of the above described construction; the thermoplastic resin film can exhibit significantly improvement gas barrier property as compared with a known film having dispersed therein fine particles of the second thermoplastic resin (Col.3, lines 23 - 28). Moreover, Momose teaches in the embodiment illustrated in Fig.1 that the fibrils or tapes of resin P1 show at least 4 die lines. Thus anticipating all limitations in the subject claims.

Applicant disagrees with the reading of Momose. Momose does not teach that the width and thickness of the tapes have a mean of these two dimensions that is less than or equal to about 5μm. Momose specification states as follows:

> Each of the tapes 3 generally has a width of 75 μm or more. The gas barrier property of the film **1** becomes better as the width of the tape **3** becomes larger. Thus, **it is important that a portion of the tapes 3 should have a width of at least 200 times. preferably 1000 times the thickness of the matrix 2**. The presence of one or more tapes **3** having the same width of the matrix **2** is most preferred. **The thickness of the tapes 3 is preferably in the range of 0.05 to 10 μm, more preferably 0.1 to 5 μm.** The content of the tapes **3** is preferably 1-40%, more preferably 1-25% based on the total volume of the tapes **3** and the matrix **2**. **The thickness of the matrix varies with the purpose for which the film 1 is used, but generally in the range of 2.5 μm to 1.6 mm.** When the film **1** is to be used as a film for forming a cushioning material, the matrix **2** preferably has a thickness of 2.5-80 μm. more preferably 5-30 μm. In case where the film 1 is intended to be used as a wrapping fllm, the matrix **2** preferably has a thickness of 0.02-1.6 mm, more preferably 0.05-0.4 mm.

Momose at Col. 3, ll. 3-22 (emphasis added). Thus, Momose does not disclose the limitation that the average or mean of the width and thickness are less than or equal to about 5μm as Momose expressly requires that the width of the tapes be 200 to 1000 time larger than the thickness of the matrix. Based on this disclosure, the thickness of the matrix varies in a range of 2.5μm to 1.6mm, which means that the tapes have a width in a range of 500μm to 1600mm. Thus, the Momose tapes have a mean of the width and thickness (250μm to 800mm) well outside (several orders of magnitude outside) of the mean of the width and thickness of the fibrils of this invention, which are less than or equal to about 5μm.

Because Momose does not disclose the limitation that average or mean of the width and thickness of the fibril be less than or equal to about 5μm, Momose cannot anticipate the claims of this invention. Applicant, therefore, respectfully requests withdrawal of this rejection.

Claim Rejections - 35 USC § 103

14. **Claims 49-55 and 96-97** are rejected under 35 U.S.C.103(a) as being unpatentable over Momose US Patent No 5,019,439 in view of Gash US Patent No 4,243,463.

The Examiner states and contends as follows:

> 15. Considering claims 49 - 55 and 96 - 97, Momose teaches an extruded oriented film comprising a layer of alloy of two polymers, the second resin corresponding to applicants P1 and the first resin corresponding to applicants P2. The first resin may be, for example, a polyolefin such as polyethylene or polypropylene, polystyrene, a polyacrylonitrile, polyester, a polycarbonate, poly vinyl chloride, or a modified resin thereof. The second resin may be, for example, a polyamide, a saponified ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer EVOH (Col.3, lines 42 -48); both resins are partially crystalline under 100°C (*i.e.* nylon 6 P1 and polyethylene P2, as described in example 2); wherein P2 in its unoriented state at 20°C exhibits a coefficient or modulus of elasticity more than 15 % lower than P1, and the alloy comprises a dispersion of microscopically fine fibrils (tapes) of P1 surrounded by P2. These fibrils or tapes extend each mainly in one direction and has width and thickness lower than 5 µm; said fibrils are flat and substantially parallel with the plane of the film, with thickness preferably in the range 0.05 to 10 µm and width more than five times the thickness (Col.3, lines 1-21).
>
> The limitation for the P1 fibrils to exhibit "locations of rupture", as discussed above in the 112 rejection it is interpreted to mean points of discontinuation. Momose teaches in the embodiment illustrated in Fig.1 that fibrils or tapes of polymer P1 are discontinuous, thus meeting the limitation in the subject claims.
>
> Momose does not specifically recognize that the composite be a cross lamination of the polymeric films.
>
> Gash teaches that cross laminates of monoaxially oriented, thermoplastic polymeric films have a number of advantageous properties; in particular they have much better tear resistance than a single play film of the same overall thickness and of the same polymer which has been biaxially oriented (Col.1, lines 24 - 29).
>
> It would have been obvious to one having ordinary skill in the art at the time the invention was made to cross laminate the extruded oriented films of Momose when it is desired to provide films with improved tear resistance.

Applicant reasserts its arguments relating to Momose here. However, the addition of Gash does not address the deficiencies of Momose as it relates to the mean of the width and thickness of the fibrils being less than or equal to 5µm. Thus, the combination of Momose and Gash does not disclose or even suggest to one of ordinary skill to prepare a crosslaminate that include fibrils of a first polymer dispersed in a second polymer where the mean of the width and thickness of the fibrils are less than or equal to 5µm.

Because the combination of Momose and Gash does not disclose or even suggest films of this invention, the combination cannot render claims 49-55 and 96-97 obvious. Applicants, therefore, respectfully request withdrawal of this rejection.

16. **Claims 60-66** stand rejected under 35 U.S.C.103(a) as being unpatentable over Momose US Patent No 5,019,439 in view of Desarzens et al. US Patent No 6, 326,411 B1.

The Examiner states and contends as follows:

> 17. Considering claims 60 - 66, Momose teaches an extruded oriented film comprising a layer of alloy of two polymers, the second resin corresponding to applicants P1 and the first resin corresponding to applicants P2. The first resin may be, for example, a polyolefin such as polyethylene or polypropylene, polystyrene, a polyacrylonitrile, polyester, a polycarbonate, poly vinyl chloride, or a modified resin thereof. The second resin may be, for example, a polyamide, a saponified ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer EVOH (Col.3, lines 42 -48); both resins are partially crystalline under 100°C (*i.e.* nylon 6 P1 and polyethylene P2, as described in example 2); wherein P2 in its unoriented state at 20°C exhibits a coefficient or modulus of elasticity more than 15 % lower than P1, and the alloy comprises a dispersion of microscopically fine fibrils (tapes) of P1 surrounded by P2. These fibrils or tapes extend each mainly in one direction and has width and thickness lower than 5 µm; said fibrils are flat and substantially parallel with the plane of the film, with thickness preferably in the range 0.05 to 10 µm and width more than five times the thickness (Col.3, lines 1-21).
>
> Momose does not specifically recognize that the extruded oriented film be a cellular expanded film.
>
> Desarzens et al.teaches an extrusion composition comprising a polymer, an adsorption agent including an expansion agent and a nucleating agent (Abstract). Furthermore, Desarzens et al. also teaches that by means of polymer extrusion technology, cellular structure materials of very variable apparent densities can be produced (Col.1, lines 16 -19).
>
> It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate expanding agents to Momose's polymeric composition when it is desired to obtain films having apparent density lower than the density of the unexpanded films. The weight proportion of P1 to P2 would be a result effective variable related to the final application of the thermoplastic polymeric cellular expanded film.

Applicant reasserts its arguments relating to Momose here. However, the addition of Desarzens et al. does not address the deficiencies of Momose as it relates to the mean of the width and thickness of the fibrils being less than or equal to 5µm. Thus, the combination of Momose and Desarzens et al. does not disclose or even suggest to one of ordinary skill to prepare a crosslaminate that include fibrils of a first polymer dispersed in a second polymer where the mean of the width and thickness of the fibrils are less than or equal to 5µm.

Because the combination of Momose and Desarzens et al. does not disclose or even suggest films of this invention, the combination cannot render claims 49-55 and 96-97 obvious. Applicants, therefore, respectfully request withdrawal of this rejection.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W.Strozier at 713.977.7000

The Commissioner is authorized to charge or credit Deposit Account 501518 for any additional fees or overpayments.

Respectfully submitted,

Date: **5 May 2010**

/Robert W.Strozier/

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